

Docket No.: WAVE-004XX

BROADCAST BROWSER INCLUDING MULTI-MEDIA TOOL OVERLAY
AND METHOD OF PROVIDING A CONVERGED MULTI-MEDIA DISPLAY
INCLUDING USER-ENHANCED DATA

FIELD OF THE INVENTION

[0001] The present invention relates generally to a system and method of creating and sharing enhancements to and in connection with a broadcast program to enhance the viewing experience of a number of viewers of the broadcast program. More particularly, the present invention concerns an overlay of multi-media tools which a system user may manipulate to create and engage in an interactive display with a broadcast program, and to transmit or otherwise provide the enhancements that he or she has created to additional users linked to the first user over a computer network, such as the Internet.

BACKGROUND OF THE INVENTION

[0002] Prior art systems are known which integrate television broadcasts with other video or audio content such as a stream of data broadcast over the internet. Although such merged displays may be interactive, they are preset in content and cannot be dynamically changed or dynamically created by the viewers of the broadcast nor shared with others.

DESCRIPTION OF THE DRAWINGS

[0003] The present invention will be better understood by reading the following detailed description, taken together with the drawings wherein:

[0004] FIG. 1 is a schematic diagram of one exemplary system embodying the principles of the present invention, wherein multiple users view a broadcast program and simultaneously share information over a wide area network;

[0005] FIG. 2 is a more detailed schematic diagram of each viewer display and manipulation system according to the present invention;

[0006] FIG. 3 is a more detailed schematic diagram illustrating the inputs to a dynamic display controller of the present invention and an exemplary dynamically changed output;

[0007] FIG. 4 is diagram showing the multiple layers that are displayed on a viewer display device;

[0008] FIG. 5 shows a converged display including the multiple layers of FIG. 4, including a background layer for displaying a broadcast program and a user-prepared enhancement overlay layer;

[0009] FIG. 6 is a schematic diagram of another exemplary system embodying the principles of the present invention, wherein multiple system users enhance a broadcast program via a set of multi-media tools provided by a Web server over the Internet;

[00010] FIG. 7 is another diagram showing the multiple layers that are displayed on a viewer display in the embodiment of FIG. 6;

[00011] FIG. 8 shows a converged display including the multiple layers of FIG. 7, including a broadcast program (background) layer, a user-prepared enhancement overlay layer and a multi-media tool overlay layer; and

[00012] FIG. 9 is a flow chart of one exemplary method of generating, providing and displaying user-prepared enhancements to a plurality of viewers of a broadcast program.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[00013] A system 10, FIG. 1, on which the present invention can be utilized and which embodies the present invention, includes a plurality of multi-media presentation systems (workstations) 12 maintained by a plurality of system users or viewers. (The term user and viewer will be used interchangeably in the remainder of this description and should be construed to mean a person who perceives a broadcast program using his or her senses, including but not limited to sight and hearing.) The term multi-media presentation system is used herein to indicate a system capable of presenting at least video information to a user, although such systems generally also are capable of presenting audio information as well. However, the presentation of more than one media should not be construed as a limitation of the present invention.

Examples of such multi-media presentation systems 12 include personal computer (PC) systems, PC televisions (PCTVs) and the like.

[00014] Each multi-media presentation system 12 includes a viewer computer 14, at least one display device 16, such as a monitor or television set, at least one audio output 18, such as one or more speaker that may be an internal component of a television set display device or provided as a separate speaker or multiple speakers. Each user multi-media presentation system 12 also includes at least one input device 20, such as a keyboard, mouse, digitizer pad, writing pad, microphone, camera or other pointing or input generating device.

[00015] As will be described more fully below, each multi-media presentation system 12 is provided with at least one broadcast program signal 22, which may be provided in the form of broadcast television programming (including cable and satellite television), closed circuit television, Internet web-TV or the like, received by means of a standard television broadcast signal over the air waves, cable television or satellite television, utilizing a tuner in each user computer 14. A broadcast program signal 22 may also be received from information stored on storage device 30 such as a hard drive, DVD, CD ROM, memory device or card, cassette tape, VCR tape, or other similar storage devices. In addition, each multi-media presentation system interfaces with a computer network 24,

which may be provided in the form of a local area network (LAN), a wide area network (WAN) or a global computer network, such as the Internet.

[00016] In one embodiment of the present invention illustrated and described herein for illustrative purposes only, the layout or arrangement of the network is in a peer-to-peer configuration. In yet another embodiment contemplated by the present invention, the present invention can be implemented in a configuration wherein a user or webmaster creates a web page, using the teachings of the present invention, for viewing by others. The web page would include the interactive content described herein. Third parties (generally unaffiliated with the interactive content creator) can then access the created web page and view/display the same in connection with a broadcast signal being displayed. In this embodiment, the unaffiliated third party viewer of the enhanced display need not even have the tools described herein.

[00017] In yet another embodiment, the tools described herein may include only a limited set of tools or a tool set that creates interactive events and content only for the present view, and will not and cannot be sent to third parties. For example, a local user may be able to "click" on a display with a mouse and "throw a pie" onto a broadcast display at the location pointed to. Accordingly, the present invention may include only limited and/or local viewer controls.

[00018] The components of an example of a multi-media presentation system 12 are shown in FIG. 2. The heart of each such system is the user computer 14. Each user computer includes a central processing unit (CPU) 26, which controls the functions of the presentation system. The CPU interfaces a broadcast receiver 28, which itself receives, as its input, the broadcast program signal 22. In one embodiment, the broadcast receiver 28 is a broadcast channel tuner which receives broadcast signals from a source such as a television broadcasting station or other programming provider or source.

[00019] Each user computer 14 also includes one or more internal storage devices 30, such as a disk drive, memory or CD ROM where data, including overlays (as well as the broadcast data), may be stored. A communications controller 32 is also provided in each user computer 14, to control inputs received from and outputs transmitted to the other viewers via computer network 24. The communications controller 32 may act as a second receiver for receiving a second data stream provided to the user computer over the computer network.

[00020] In the preferred embodiment, the communications controller 32 may include a device such as a modem (for example, a telephone or cable modem) or a network interface card which receives information from a local or wide area network.

[00021] A dynamic display controller 34 (also referred to herein as a broadcast browser) is also provided with each user computer 14. The dynamic display controller interfaces the CPU 26, broadcast receiver 28 and communications controller 32 and receives, as input, the multiple data streams provided to the user computer by one or more of the broadcast program signal 22, the computer network 22 (via the communications controller 32) and the internal storage device 30. The dynamic display controller 34 merges the multiple input signals and outputs a merged data signal to the display device 16. An audio processor 36 may also be provided, as necessary, to receive audio data from the multiple data sources and to provide the same to the audio output device(s) 18.

[00022] In the preferred embodiment of the present invention, which is disclosed for illustrative purposes only and not considered a limitation of the present invention, the dynamic display controller 34 is implemented as computer software in the form of a browser user interface operating on the user computer 14, which is a personal computer or individual computer workstation. Other embodiments contemplated include a client server configuration whereby a user computer 14 is connected to a server (not shown) which contains all or at least part of such computer software forming the dynamic display controller 34.

[00023] Each multi-media presentation system 12 also includes

at least one input device 20, which allows a first user to direct input to the dynamic display controller 34 to control what is displayed on the display device 16, thereby allowing the user to control (i.e. generate) their viewing experience and in addition, to control the saving and/or displaying of the experience to the remaining users of the system 10, as will be explained in greater detail below. As can be seen more clearly from FIG. 3, each user computer CPU 26 receives, as a first input, a first data stream, such as a multi-media broadcast program signal 22 via broadcast receiver 28. It may also receive, as a second input, a data stream 40 including one or more third party, user-prepared, enhancements to the broadcast signal input by a system user using one or more input device 20. Typically the user would interject images (video, hand drawn images, pictures, clip art, or the like), objects, audio (voice or other sound(s)) and/or text to be displayed on his or her display device 16. In this manner, a user can dynamically create a user experience in accordance with his or her personal preferences. As will become more fully apparent below, this user can also share his or her dynamically created user-prepared enhancements with other system users, to enhance their viewing experience or allow others to further modify and share their experience as well.

[00024] As a third optional input, each user computer CPU may receive, via communications controller 32, a third data stream 42,

which is made up of shared enhancements to the broadcast program signal which were created by other users of the system and transmitted to the user computer over the computer network 24. The user computer CPU 26 merges the two or more data streams and provides a merged signal 44 to the display device 16. The CPU also provides, to communications controller 32, the data stream made up of the user-prepared enhancements, which the communications controller 32, in turn, transmits as a shared enhancement data stream 42' to the other users of the system. Alternatively, the enhanced data stream 42' may be stored on the user's internal storage device 30 for later replay or later transmission to others.

[00025] As can be appreciated, using such a system, a user can enhance not only his or her viewing experience by preparing user-prepared enhancements, but he or she can also enhance the viewing experience of all users of the system by sharing his or her user-prepared enhancements to the other users of the system thereby creating a "community" viewing experience for connected/subscribed users.

[00026] FIGS. 4 and 5 show how a layering or "overlay" strategy is utilized by the dynamic display controller 34 to control the display of the data provided by a broadcast signal and data representing user-prepared enhancements so that all of the data may be displayed in a single window or screen on each display

device 16. The dynamic display controller displays, in a "background" layer 50, the broadcast signal. Then, an overlay is displayed in the same window in at least one additional layer 54 on top of the background layer 50. (It is understood that the order or layers can be reversed, if desired.) In order to allow the broadcast signal in the background layer 50 to be visible through the second layer 54, the second layer utilizes a substantially transparent background 56 or, as is disclosed herein, a background called or named "broadcast" to signify the source of the background information.

[00027] One method of creating an "overlay" is to display the second or overlay layer as a "partial" layer. For example, every third pixel might be turned on or used. This would leave two-thirds of the pixels through which the background image could "bleed through". Another technique would be to resize the broadcast image to, for example, four-fifths ($4/5$'s) of its normal size, and place the interactive information and/or tools in the margins or otherwise in the remainder of the one-fifth ($1/5$) viewing image not utilized for the broadcast signal. Other methods may also be utilized without departing from the scope of the present invention.

[00028] At least one of the additional layers 54 includes a one or more of user-selectable multi-media tools 56, which may be provided in the form of a toolbar 58. Of course, the toolbar 58

may be re-positioned to any portion of the screen as the user desires as is well known in the art. The user-selectable tools 56 allow a user to manipulate the overlay to modify the layers displayed on his or her display device.

[00029] Examples of user-selectable tools include drawing tools that allow a user to reference or comment on one or more objects appearing in the underlying broadcast signal on the background layer of the display. Such drawing tools may include lines, arrows, text boxes, thought bubbles, speech bubbles and the like. The user-selectable tools may also include one or more graphic insertion tools, which are responsive to a user input, to insert a graphic (image, picture, drawing, video clip, etc.) obtained from a graphic library into the overlay being displayed in the additional layer 54. Such graphics libraries may be stored in internal storage provided by the user computer or may be stored in remote databases, which are accessible via the computer network. Other examples include a magnifying glass, circle, square of other geometric shape, animated or non-animated character, escaping gas bubble, burst, explosion, highlighting or in short, anything object, shape, device or action that references the underlining broadcast programming.

[00030] The user-selectable multi-media tools may also include an audio device to receive, store, edit and/or otherwise provide user-prepared auditory enhancements to the broadcast program. Of

course, like the video signals transmitted to the other users, user-prepared auditory enhancements can also be transmitted to the additional system users over the computer network where they would be output on audio output devices included at each user's multi-media presentation system.

[00031] In addition to the possible text, graphic and audio tools, the tools may also include a user-selectable delivery icon, which can be used by the user to trigger the delivery of any user-prepared enhancements to those of the plurality of additional system users who are included on a delivery list maintained by the user of the system that has created the user-prepared enhancements. Of course, only those additional system users that are logged onto their system and viewing the same underlying broadcast program as the user creating the enhancements will be able to display or otherwise output the shared enhancements on their display or audio output devices however, the user created enhanced broadcast may be stored on a storage device of another user for viewing at a later time by the user.

[00032] When the multiple data streams are merged, the resulting display appearing on the display device may appear in a single window 60, where the user-prepared enhancements will directly coincide with the portions of the underlying broadcast data stream to which they are directed if the user creating the

enhancement creates and sends/stores them as they coincide with the broadcast signal.

[00033] For example, speech bubbles 62 or thought bubbles 64 can be positioned adjacent a character 66 to which the speech or thought is to be attributed, text or speech inserted, and then transmitted (such as by hitting the return key or clicking the "mouse" button) or stored such that the respective alignment of the enhancements with the broadcast signal is maintained. Text boxes 68 may be positioned where they will minimize interference with important objects appearing in the underlying broadcast.

[00034] In another embodiment, the user may simply view only another's parties interactive information or overlay. In yet another embodiment, the interactive portion and the broadcast signal portion of the ultimate display may be merged prior to their arriving at the user's viewing device and therefore would be played out and viewed as one stream of information containing both the broadcast signal information and the interactive signal portion.

[00035] FIGS. 6-8 show an alternative embodiment of a system 10 for communicating between a plurality of multi-media presentation participants. In this embodiment, each user multi-media presentation system 12 interfaces with a Web server 70 via the Internet 72. The Web server 70 provides a multi-media tool overlay 74 as well as a user-prepared enhancement overlay 76.

[00036] Each user multi-media presentation system 12 is similar to those described above with respect to the embodiment of FIGS. 1 and 2. However, instead of storing a multi-media tool overlay in local system memory and having the dynamic display controller retrieve the overlay from the system memory, in this embodiment, each user computer accesses the web server 70, where the overlay information is maintained. Nonetheless, each user computer would still include a dynamic display controller 34 for merging the overlay information accessed and manipulated via the web server with the broadcast presentation 22 received directly by each user system.

[00037] In this embodiment, since multiple users will access a common multi-media tool overlay 74, a display strategy utilizing three or more layers may be utilized. In this manner, each system user can access the same tool overlay and use the tool overlay to create and store user-prepared enhancements to the broadcast signal that are stored on a third display layer 52. Each user will have a unique third display layer 52, which may also be referred to as a user-prepared enhancement overlay. While there will be a common multi-media tools overlay, each user will create his or her own user-prepared enhancement overlay.

[00038] The user-prepared enhancement overlay will then be transmitted to the other users of the system in a manner similar to that described above with respect to the self-contained, peer-

to-peer system of FIGS. 1 and 2. Once the layers are merged by the dynamic display controller, the use of transparent backgrounds on the each overlay layer will allow the display to appear as if the user-prepared enhancements were simply inserted into the underlying broadcast as is shown in FIG. 8.

[00039] In order to emphasize user-prepared enhancements, a special tool may be provided with the plurality of multi-media tools. This tool will be referred to as a "broadcast mute" tool. The purpose of the broadcast mute "tool" is to dampen or otherwise minimize the interference of the underlying broadcast signal so that the user-prepared enhancement overlay appear more prominently in the merged display. One means by which the broadcast mute feature may emphasize the user-prepared enhancement overlay is to provide a video mute feature. The video mute feature may be implemented as a control for the brightness and/or contrast and/or hue signal of the underlying broadcast signal sent to the display device. By lowering either or both of the brightness or contrast signal to the display device, the appearance of the broadcast data in the merged display will be dampened so that the user-prepared enhancements will be more prominent. Another embodiment contemplates that another layer may be inserted between the broadcast signal layer and the interactive layer softening the background providing for more contrast to the interactive layer.

[00040] Since the purpose of the broadcast mute tool is to provide emphasis to the user-prepared enhancements, when such enhancements are provided to the remainder of the users as shared enhancements, selection of the broadcast mute tool will affect the underlying broadcast signal of all users to whom the enhancement is shared.

[00041] In a similar manner as the broadcast mute tool, the tool set 58 may also include an audio mute tool. The audio mute tool will operate generally in a similar manner to the video mute tool. However, instead of affecting the underlying broadcast's video signal, it would allow audio enhancements to be highlighted by reducing the volume of the underlying broadcast signal. Of course both the video mute and audio mute features could be used together.

[00042] A method of generating and providing user-prepared enhancements to a plurality of viewers of a broadcast program 100 is shown in FIG. 9. To utilize the method, a plurality of viewers of the broadcast program will utilize a display device for viewing the broadcast program. Each viewer will also have a computer for controlling the display device and for interfacing each user to the other viewers over a computer network.

[00043] The method 100 begins by displaying a broadcast program in a background layer on at least one viewer display device, act 110. Next, at least one overlay layer is provided on each viewer

display device, act 120. Each overlay layer includes a transparent background to allow the broadcast program being displayed on the background layer to "bleed through". At least one of the overlay layers includes a plurality of user selectable multi-media tools, which are responsive to user input, for manipulating at least one overlay layer by including user-prepared enhancements thereupon.

[00044] Then, user interaction with the provided multi-media tools is monitored and any user-prepared enhancements input by a viewer using the tools is stored, act 130. The user-prepared enhancements are then transmitted to any additional users of the system who are viewing the underlying broadcast presentation, act 140. Preferably, the user-prepared enhancements are transmitted in response to a user selectable delivery icon so that the user can complete the user-prepared enhancement and then deliver the enhancement when he or she so desires and to whom he or she desires.

[00045] Finally, in act 150, the user-prepared enhancement that has been transmitted to the additional system users is displayed on at least one overlay layer on top of the broadcast layer being displayed on a display device at a receiving user's system.

[00046] Accordingly, the system and method described above, which embody the present invention, allows viewers of a broadcast presentation to enhance their own viewing experience and enhance

the viewing experience of others by preparing and sharing multi-media enhancements to the underlying broadcast presentation.

[00047] Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention, which is not to be limited except by the claims which follow.